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Qualifications

Principal Investigator
Period : 01.09.2021 - * in Institute for Molecular Medicine Finland

Employment

Academy Research Fellow
Institute for Molecular Medicine Finland
University of Helsinki
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1 Sept 2021 → present

Bioimage Profiling
University of Helsinki
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Supervisor for doctoral programme
Doctoral Programme in Integrative Life Science
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1 Jan 2014 → present

Publications

Functional screening identifies kinesin spindle protein inhibitor filanesib as a potential treatment option for hepatoblastoma
Nousiainen, R., Eloranta, K., Saarela, J., Hassinen, A., Luck, T. J., Cairo, S., Indersie, E., Potdar, S., Feodoroff, M. J., Lohi, J., Paavolainen, L., Wilson, D. B., Pietiäinen, V., Heikinheimo, M. & Pihlajoki, M., 25 Apr 2025, In: npj precision oncology. 9, 1, 18 p., 122.

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Artificial intelligence aided serum protein electrophoresis analysis of Finnish patient samples: Retrospective validation
Lahtiharju, T., Paavolainen, L., Suvisaari, J., Nokelainen, P., Rotgers, E., Anttonen, M. & Itkonen, O., 1 Feb 2025, In: Clinica Chimica Acta. 567, 7 p., 120086.

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Piki, E., Dini, A., Rantanen, F., Bentz, F., Paavolainen, L., Barker, H., Raivola, J., Hirasawa, A., Kallioniemi, O., Murumägi, A. & Ungureanu, D., 19 Dec 2024, In: Molecular Therapy Oncology. 32, 4, 15 p., 200903.

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Image-based and machine learning-guided multiplexed serology test for SARS-CoV-2
Paavolainen, L., Hassinen, A., Polso, M. M. M., Pietiäinen, V. & Kemmer, I., 7 Mar 2024

Drug repurposing platform for deciphering the druggable SARS-CoV-2 interactome
Bogacheva, M., Kuivanen, S., Potdar, S., Hassinen, A., Huuskonen, S., Pöhner, I., Luck, T. J., Turunen, L., Feodoroff, M., Szirovicza, L., Savijoki, K., Saarela, J., Tammela, P., Paavolainen, L., Poso, A., Varjosalo, M., Kallioniemi, O., Pietiäinen, V. & Vapalahti, O., Mar 2024, In: Antiviral Research. 223, 15 p., 105813.

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Application of Self Supervised Vision Transformers for Multiplexed Microscopy Images and Its Challenges
Atarsaikhan, G., Mogollon Figueroa, I., Välimäki, K., Pellinen, T., Mirtti, T. & Paavolainen, L., 16 Dec 2023.

Analysis of cellular phenotypes with unbiased image-based generative models
Fonnegra, R., Sanian, M. V., Chen, Z. S., Paavolainen, L. & Caicedo, J. C., 28 Nov 2023.

Image-based and machine learning-guided multiplexed serology test for SARS-CoV-2
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Phosphorylation of PACSIN2 at S313 Regulates Podocyte Architecture in Coordination with N-WASP
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Fibroblast subsets in non-small cell lung cancer: Associations with survival, mutations, and immune features
Pellinen, T., Paavolainen, L., Martin-Bernabe, A., Araujo, R. P., Strell, C., Mezheyeuski, A., Backman, M., La Fleur, L., Brück, O., Sjolund, J., Holmberg, E., Välimäki, K., Brunnström, H., Botling, J., Moreno-Ruiz, P., Kallioniemi, O., Micke, P. & Östman, A., 10 Jan 2023, In: Journal of the National Cancer Institute. 115, 1, p. 71–82 12 p.

Prognostic Role of Tumor Immune Microenvironment in Pleural Epithelioid Mesothelioma
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Bruck, O., Lee, M. H., Turkki, R., Uski, I., Penttilä, P., Paavolainen, L., Kovanen, P., Järvinen, P., Bono, P., Pellinen, T., Mustjoki, S. & Kreutzman, A., Dec 2021, In: Modern Pathology. 34, 12, p. 2229-2241 13 p.

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Szkalisity, A., Piccinini, F., Beleon, A., Balassa, T., Varga, I. G., Migh, E., Molnar, C., Paavolainen, L., Timonen, S., Banerjee, I., Ikonen, E., Yamauchi, Y., Ando, I., Peltonen, J., Pietiäinen, V., Honti, V. & Horvath, P., 5 May 2021, In: Nature Communications. 12, 1, 9 p., 2532.

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Hollandi, R., Szkalisity, A., Toth, T., Tasnadi, E., Molnar, C., Mathe, B., Grexa, I., Molnar, J., Balind, A., Gorbe, M., Kovacs, M., Migh, E., Goodman, A., Balassa, T., Koos, K., Wang, W., Caicedo, J. C., Bara, N., Kovacs, F. & Paavolainen, L. & 5 others, Danka, T., Kriston, A., Carpenter, A. E., Smith, K. & Horvath, P., 20 May 2020, In: Cell Systems. 10, 5, p. 453-+ 12 p.

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Chan, K. T., Blake, S., Zhu, H., Kang, J., Trigos, A. S., Madhamshettiwar, P. B., Diesch, J., Paavolainen, L., Horvath, P., Hannan, R. D., George, A. J., Sanij, E., Hannan, K. M., Simpson, K. J. & Pearson, R. B., Feb 2020, In: Cell Death and Differentiation. 27, 2, p. 725-741 17 p.

Association of tamoxifen resistance and lipid reprogramming in breast cancer
Hultsch, S., Kankainen, M., Paavolainen, L., Kovanen, R.-M., Ikonen, E., Kangaspeska, S., Pietiäinen, V. & Kallioniemi, O. , 24 Aug 2018, In: BMC Cancer. 18, 14 p., 850.

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Bramante, S., Pietiainen, V., Paavolainen, L., Pasanen, A., Makinen, N., Heinonen, H.-R., Ikonen, P., Heikinheimo, O., Sjoberg, J., Butzowand, R. & Aaltonen, L., Jul 2018, In: Cancer Research. 78, 13, 2 p.

Phenotypic heterogeneity of patient-derived tumor cells visualized by unsupervised analysis in cell-based personalized drug testing
Turkki, R., Paavolainen, L., Mikkonen, P., Ostling, P., Horvath, P., Pietiainen, V. & Kallioniemi, O., Jul 2018, In: Cancer Research. 78, 13, 2 p.

Precision cancer medicine based on 3D drug profiling of patient-derived cancer cell spheroid models
Mikkonen, P., Turunen, L., Paasonen, L., Potdar, S., Paavolainen, L., Murumagi, A., Kallioniemi, O. & Pietiainen, V. M., Jul 2018, In: Cancer Research. 78, 13, 2 p.

Intelligent image-based in situ single-cell isolation
Brasko, C., Smith, K., Molnar, C., Farago, N., Hegedus, L., Balind, A., Balassa, T., Szkalisity, A., Sukosd, F., Kocsis, K., Balint, B., Paavolainen, L., Enyedi, M. Z., Nagy, I., Puskas, L. G., Haracska, L., Tamas, G. & Horvath, P., 15 Jan 2018, In: Nature Communications. 9, 1, 7 p., 226.

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Blom, S., Paavolainen, L., Bychkov, D., Turkki, R., Maki-Teeri, P., Hemmes, A., Valimaki, K., Lundin, J., Kallioniemi, O. & Pellinen, T., 14 Nov 2017, In: Scientific Reports. 7, 13 p., 15580.

UNC-45a promotes myosin folding and stress fiber assembly
Lehtimaki, J. I., Fenix, A. M., Kotila, T. M., Balistreri, G., Paavolainen, L., Varjosalo, M., Burnette, D. T. & Lappalainen, P., 20 Oct 2017, In: Journal of Cell Biology. 216, 12, p. 4053-4072 20 p.

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Saeed, K., Ojamies, P., Pellinen, T., Rahkama, V., Eldfors, S., Paavolainen, L., Turkki, R., Horvath, P., Lundin, J., Nisén, H., af Hällström, T. M., Rannikko, A., Mirtti, T., Kallioniemi, O. & Östling, P., 17 Oct 2017, In: Annals of Oncology. 28, Suppl 7, 1 p.

Data-analysis strategies for image-based cell profiling
Caicedo, J. C., Cooper, S., Heigwer, F., Warchal, S., Qiu, P., Molnar, C., Vasilevich, A. S., Barry, J. D., Bansal, H. S., Kraus, O., Wawer, M., Paavolainen, L., Herrmann, M. D., Rohban, M., Hung, J., Hennig, H., Concannon, J., Smith, I., Clemons, P. A. & Singh, S. & 4 others, Rees, P., Horvath, P., Linington, R. G. & Carpenter, A. E., Sept 2017, In: Nature methods. 14, 9, p. 849-863 15 p.

Precision medicine approach: Analysis of renal cancer patient-derived cells with phenomics, genomics and drug sensitivity profiling
Pietiainen, V. M., Mikkonen, P., Saeed, K., Paavolainen, L., Pellinen, T., Potdar, S., Mpindi, J., Nisen, H., Rannikko, A., Mirtti, T., Horvath, P., Ostling, P. & Kallioniemi, O., Jul 2017, In: Cancer Research. 77, 2 p.

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Piccinini, F., Balassa, T., Szkalisity, A., Molnar, C., Paavolainen, L., Kujala, K., Buzas, K., Sarazova, M., Pietiainen, V., Kutay, U., Smith, K. & Horvath, P., 28 Jun 2017, In: Cell Systems. 4, 6, p. 651-+ 10 p.

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Huttunen, M., Turkki, P., Maki, A., Paavolainen, L., Ruusuvuori, P. & Marjomaki, V., Mar 2017, In: Cellular Microbiology. 19, 3, 13 p., 12671.

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Saeed, K., Rahkama, V.-P., Eldfors, S., Bychkov, D., Mpindi, J. P., Yadav, B., Paavolainen, L. O., Aittokallio, T. A., Heckman, C. A., Wennerberg, J. K., Rannikko, A. S., Horvath, P., Mirtti, T. K., Peehl, D., Kallioniemi, O.-P., Östling, P. K. & af Hällström, T. M., 2017, In: European Urology. 71, 3, p. 319-327 9 p.

Combining High-Content Imaging and Phenotypic Classification Analysis of Senescence-Associated Beta-Galactosidase Staining to Identify Regulators of Oncogene-Induced Senescence
Chan, K. T., Paavolainen, L., Hannan, K. M., George, A. J., Hannan, R. D., Simpson, K. J., Horvath, P. & Pearson, R. B., Sept 2016, In: Assay and drug development technologies. 14, 7, p. 416-428 13 p.

Awards

PanCanPro: Solutasoinen syövän mikroympäristön spatiaalinen profilointi ja sen kliiniset korrelaatiot
Paavolainen, L. (Project manager)
Academy of Finland: €264,172.00
01/09/2024 → 31/08/2028

Projects

Academy of Finland FIRI2020/ Biocenter Finland/ Single Cell Competence Center
Pietiäinen, V. (Participant), Hassinen, A. (Participant), Polso, M. M. M. (Participant), Horvarth, P. (Participant) & Paavolainen, L. (Participant)
01/12/2020 → 31/12/2021

iCAN-DIP: AI-driven deep image-based profiling of pan-cancer tumor microenvironment
Atarsaikhan, G. (Participant) & Paavolainen, L. (Principal Investigator)
01/01/2023 → 31/12/2024

Covid-19 immunofluoresenssidetektiomenetelmän kehitys
Pietiäinen, V. (Principal Investigator), Polso, M. M. M. (Participant), Horvarth, P. (Participant) & Paavolainen, L. (Participant)

01/01/2020 → 31/01/2021

PanCanPro: Decoding pan-cancer tumor microenvironment with integrative single-cell spatial profiling
Paavolainen, L. (Project manager) & Atarsaikhan, G. (Participant)
Academy of Finland
01/09/2024 → 31/08/2028

Deep learning for phenotypic profiling of cancer cells
Paavolainen, L. (Project manager)
SUOMEN AKATEMIA
01/09/2017 → 31/08/2020

Deep learning for single-particle analysis
Paavolainen, L. (Project manager)
01/01/2019 → 30/06/2020

FIRI Lassi Paavolainen
Paavolainen, L. (Project manager), Harjuniemi, M. M. (Participant), Hassinen, M. V. (Participant), Kesälä, E. (Participant), Koljonen, N.-V. (Participant), Metsä, P. (Participant), Niklander, T. M. (Participant), Rantanen, R. J. (Participant), Saarinen, M. J. (Participant), Siidirätsep, A. (Participant), Silander, J.-M. (Participant) & Syrjänen, S. J. (Participant)
Suomen Akatemia Projektilaskutus
01/01/2023 → 31/12/2025

Pan-cancer tumor microenvironment exploration with vision transformers
Paavolainen, L. (Project manager), Atarsaikhan, G. (Participant), Mogollon Figueroa, I. (Participant) & Mogollon Figueroa, I. (Participant)
Syöpäsäätiö sr Cancerstiftelsen sr
01/01/2023 → 31/12/2024

Uncovering patterns in cancer cells with visual representation learning
Paavolainen, L. (Project manager), Atarsaikhan, G. (Participant), Mogollon Figueroa, I. (Participant) & Sanian, M. V. (Participant)
Academy of Finland
01/09/2021 → 31/08/2026

Uncovering patterns in cancer cells with visual representation learning
Paavolainen, L. (Project manager), Atarsaikhan, G. (Participant), Bourgogne, E. A. (Participant) & Mogollon Figueroa, I. (Participant)
Academy of Finland
01/09/2024 → 31/08/2026